



Ethnobotanical Leaflets

A Publication of the Southern Illinois University Herbarium
Carbondale, IL 62901, U.S.A.



The Story of the Pineapple

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After the discovery of America, new food plants became known to European people. The pineapple symbolizes balmy tropical lands and leisurely life on tropical islands. The pineapple, as well as other agricultural crops such as maize, potatoes, beans, peanuts, and tobacco, originated in America and were unknown to people of the old World.

The story of the pineapple falls into three distinct periods. The first period precedes the discovery of America and goes back into the antiquity of South America where the pineapple is believed to have developed. There is very little information about it during this period but it is known that the pineapple was already being cultivated and widely distributed through inhabited areas of the American tropics.

The second period, covering about 400 years, extends from 1493 to 1900 when Columbus first saw pineapples on the Island of Guadeloupe in the West Indies.

The third period, beginning in 1900, is characterized by the industrial development of pineapple production and canning around the world, making the canned fruit available to people living in nontropical countries.

Wild pineapples are still to be found in parts of tropical America in which they are small fruited, inferior in eating qualities, and extremely seedy. To eat a pineapple full of these seeds is like trying to eat one of our present day seedless fruits containing one thousand small bits of gravel. It was believed that long periods of propagation of a domesticated species would result in the plant losing its ability to produce seeds. Actually there is no scientific evidence to this belief. Seedlessness usually appears in normal seed-bearing plants as a result of a mutation in the chromosomes or as a consequence of hybridization.

In 1513, Gonzalo Fernandez de Oviedo y Valdes described the pineapple in his book, "Translation of Historia General y Natural de las Indias." He said, "And if, by lack of colors in the drawing, I fail to convey what I would like to be able to say, the fault lies in my judgement in which it is, to my eyes, the most beautiful fruit of any of the fruits I have seen, and the one which has the best fragrance and flavor, as well as in it's size and color, which is green lightened or toned with a very deep yellow, and the more

it ripens the more it takes on of the deep yellow and loses the green, at the same time increasing in the fragrance of more than perfect peaches." He continues, "This is the odor which the fruit resembles most, and the flavor is better than peaches- more juicy. It is peeled all around and cut into round slices or chunks, as the carver desires, for throughout the length and breadth it has a peel, for which a sharp knife is required. Each pine grows on a very sharp thorny thistle with long prickly leaves, very wild; from the middle of this thistle emerges a round stalk which bears only one pine, which takes about 10 months or a year to ripen. Once the fruit is cut, this thistle produces no more fruit and serves for nothing except to litter the ground."

Pineapple fruits were sent from the West Indies to Europe where they were used as table decorations at dinners and banquets. As a result of the use of the fruit as decoration it became a symbol of hospitality and friendship and showed high social standing.

Although Hawaii has been a leader in commercial production of this fruit for over half a century, there is no known fact as to how or when the fruit reached these islands. The name the Hawaiian people gave to the pineapple, "Halakahiki," shows that they recognized it as an introduced plant. "Hala" is the Hawaiian word for a native plant, the screw-pine. or hala has a fruit similar to the pineapple in general appearance, but without a crown of leaves at the top.

The pineapple is of the family Bromeliaceae and is the genus *Ananas* or *Pseudananas*. The family Bromeliaceae is divided into two habitat groups, the terrestrial and the epiphytes. The terrestrial are those growing with their roots in the soil and epiphytes are those growing on other plants. Pineapples belong to the terrestrial division of the family, but have some of the characters of the epiphytes, being able to store small quantities of water in their leaf axils and in special water storage tissues in the leaves to endure periods of drought.

The pineapple is a perennial monocotyledonous plant having a terminal inflorescence and fruit. The plant bears a rosette of stiff leaves about two to four feet tall. When twelve to twenty months old the plant produces a flower stalk that bears lavender colored flowers, which produce a compound fruit known as a head, or pineapple. The fruit is fleshy and weighs from one to fifteen pounds and is surmounted by a rosette of stiff leaves called the crown. The head is the edible portion and the stalk bears a head only once while a new stalk may come up from the same plant and bear another pineapple.

There are three groups or varieties of pineapple. The Queen group, Cayenne group, and Spanish group:

1. The Queen group with the Golden pineapple has yellow flesh, a pointed eye sloping upward from the side, deep yellow fruit, and sweet in flavor.
2. The Cayenne group with the Smooth Cayenne has light yellow flesh, the eyes broad and flat, and the leaves are smooth or serrated. These are one of the best of the fancy pineapples, bearing large size fruits, very juicy and sweet in flavor. In addition, these pineapples are used for canning purposes.

3. The Spanish group with the Spanish, pineapple has white flesh, the eyes flat but elevated at the corners of the brads, and the leaves are strong and serrated. This group constitutes more than 90% of the planting of Florida. Since pineapples are injured by a temperature lower than 30°F, a frost-free site is essential for success. The soil must be well drained such as in Hawaii in seasons of excessive rainfall. The soil may be dynamited every 20 feet to a depth of 4 feet to facilitate drainage without disturbing the surface soil.

The pineapple will not thrive on soils rich in lime or manganese. Soils containing 3% of manganese cause the leaves to turn yellow and the young fruits to turn pink long before they are ripe. The fruits that do grow are extremely acid and unpalatable. Excess of lime cause the leaves to turn yellow and small fruits fail to develop their normal color.

When applying fertilizer, the Florida station reports that within three weeks or as soon as possible after setting, the plants should receive a tablespoon of cottonseed meal per plant in the base of the leaves to keep out sand. Tobacco stems are also applied in the fall or early winter to enable the plants to harden and better with stand cold weather.

In Florida, large quantities of fertilizer are applied, usually three or four applications a year, varying from half a ton to a ton per acre at each application. Different practices were used such as a fine ground steamed bone. This is a good source of phosphoric acid. Bone meal, basic slag, dried blood, cottonseed meal and castor pomace are good sources of nitrogen in the soil.

Blight or red wilt has been the most serious and destructive disease in Florida. It has been the chief cause of the decline of the industry. The tips of the leaves turn red and later wilt. The disease is due to nematodes that infest many light soils of the South. The remedy is to sow the land to velvet beans or natal grass for two or three years and starve them out, building up the humus content of soil, before replanting the pineapples. The Spanish pineapple is more resistant to this disease than Cayenne and coming up with more nematode resistant pineapples would improve the crops.

The red spider sometimes attacks the base of the leaves, causing them to rot if allowed to go unchecked. To solve this problem, throw a handful of tobacco dust in the bud of the affected plant and repeat in ten days if necessary.

Mealy bugs attack the base of the leaves near the ground, also the bud and the slips. Apply tobacco dust if the insects are discovered while at the base of the leaves. If not discovered until later, spray with fish-oil soap, resin wash or resin compound or one of the distillate oil emulsions.

A scale may cause trouble in dry localities. It appears on the under surface of the leave, which shows through to the upper surface as a yellow spot. To solve this problem, spray as for mealy bugs. It takes ten to twelve months for a seedling plant to come into bearing. The commercial method is by means of suckers, slips, crowns, and stumps.

A sucker is a shoot or small plant that develops in the axil of a leaf below the fruit stem. When these occur near the ground they quickly develop into strong plants. Slips are small plants that form just below the fruit. They require a year longer than suckers to mature a crop. Crowns are the topknots of leaves on the fruits. They are obtainable only when the fruit is used nearby for canning. For market purposes the fruit is shipped with the crown on it. Plants grown for crowns require two years to mature as fruit. Stumps produce a very vigorous growth. They may be laid in furrows like sugar cane and half or wholly buried in the sand. They are preferred to suckers in land containing high manganese content.

The pineapple fruit contains very little starch. The stump and fruit stem are rich in starch. As the fruit matures, the starch in the stump and stem are changed into sugar and transferred to the fruit so that in the last ten to fourteen days before the fruit gets ripe, its sugar content increases from 4% to 11% and in some varieties 14%. Fruit harvested while green may change its color from green to yellow but develops no more sugar. This fruit cannot compare with that which is allowed to ripen fully before harvesting. Canned pineapple made from the highest flavored varieties allowed to become fully ripe and canned within 24 to 48 hours, possess the best flavor. With ample refrigeration in transit and prompt packing and loading, pineapples may now be left on the plant until they are "ruddy-ripe" and have not turned full yellow.

The Spanish pineapples are usually seized by the crown and, with a sharp jerk, are quickly parted from the stem, The Cayenne pineapples are likely to break off in the flesh if handled this way therefore, these are cut off with a knife.

Ripe pineapples may be stored at a temperature of 32°F for a month. In some tests they were held for 45 days before they showed a slight withering. When held at 36°F the flavor deteriorated in about 35 days.

A great canning business has been developed in Hawaii for canning, cylindrical fruits weighing 3 1/2 to 5 pounds are preferred. The whole process of canning is carefully managed. The cores are used for glace fruits. The juice that would be wasted is bottled or made into syrup for soda fountains or is used in canned pineapples that need additional sugar. The fiber of the pineapple leaves may be used for making cloth and the stumps are a source for starch if needed.

As quoted before, Oviedo also said, "I do know that it (pineapple) rouses the appetite. There are many people who have a disgust for food. It restores a healthy appetite and stimulates them to endeavor to eat, restoring enjoyment." The Indians also believed in the properties of the pineapple.

Experiments with rats were done to prove these beliefs. The experiment was carried out by feeding two groups of white rats on identical balanced diets with one group having pineapples added to their diets. The results showed that the rats on the pineapple added diet grew more rapidly, gained weight more rapidly, produced larger litters, and more of their young survived.

Wingrove, an English doctor, concluded that the pineapple was an aid to digestion and the juice of the pineapple contained the protein-digesting enzyme "bromelain." He also gave directions for the use of

this fruit to supplement the digestion of protein foods when the natural secretions of the stomach were deficient.

The pineapple was also believed to be used for recovering the spirits and to help squeamish stomachs. The American Indians supposedly used the juice of the fruit as a contraceptive and this is still being studied for fact. Indians of Columbia used the fruit for relieving throat and nasal congestion, and for stomach inflammation and indigestion.

As stated before, the pineapple is one of the most beautiful fruit plants. In the tropics there are numerous areas which have all the qualifications for pineapple production except water. Many of the areas are near ocean and the salt water is not good so research is underway on the Pacific coast of California to develop economic processes for desalting ocean water for domestic and agricultural use.

Future changes and techniques will help utilization of additional land areas and supply more pineapples to people.

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Last updated: 09-December-97 / du